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A few cases were noted where sprouts were producing fruit at a very young age. On the west side of the Patagonias, a stump 15 cm. tall and 0.6 cm. top diameter had produced a sprout 1.8 meters tall and 2.5 cm. base diameter. This sprout bore 14 fully formed berries. Again, near the mountain pass on the main road between Washington Mine and Nogales, several side branches had been cut from the crown of a mature alligator juniper, and the resulting sprouts, which were 8-13 years old, ranged from 30 to 60 cm. in length. Many of them were loaded with fully formed fruits.

The sprouting ability of both these species is a controlling influence in maintaining a satisfactory reproduction in this region. Many sprouts of Chihuahua pine were found which were 10-15 cm. base diameter and 4.5-6 meters tall, and a few were found 20-22.5 cm. base diameter and 9-10.5 meters tall. Many alligator juniper sprouts were noted which were 7.5-10 cm. at the base and 4.5-4.8 meters tall. All sprouts on both species are still making a thrifty growth.—F. J. PHILLIPS,  
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## CELL DIVISION IN LYNGBYA

(PRELIMINARY NOTE)

The form here described is a large salt water species occurring at Cold Spring Harbor, L.I., and answers to the description of *Lyngbya majuscula*. In a cell of *Lyngbya* there is a large central body or nucleus, which in the stages between divisions is, except for the absence of a limiting membrane, much like the resting nuclei of the higher plants. The nucleus contains a mesh of fine fibers along which small granules are scattered. The mesh is imbedded in a clear substance resembling nuclear sap. When treated with either Haidenhain's hematoxylon or Flemming's triple, the mesh stains like linin and the granules like chromatin. Although there is no membrane or definite boundary around the nucleus, it is quite distinct from the surrounding cytoplasm. The above description is quite similar to that which OLIVE<sup>1</sup> gives of the nuclei of some of the Cyanophyceae studied by him.

As a cell of *Lyngbya* approaches division, fine fibers appear around the nucleus in a plane perpendicular to the longitudinal axis of the filament. These fibers, which have an appearance closely similar to that of the spindle fibers of other plants, are very numerous, and run from

<sup>1</sup> OLIVE, E. W., Mitotic division of the nuclei of the Cyanophyceae. Beih. Bot. Centralbl. 18:9-44. 1905.

the nucleus to the outer limits of the cytoplasm. They are all in practically the same plane, and thus form a plate across the center of the cell in the place where the cross wall, between the daughter cells, is to be produced. In several of his figures OLIVE shows fibers which appear quite like these. The stage just described, indeed, bears a close resemblance to his figs. 24-26 of *Oscillatoria*. However, since he does not describe these fibers in his text, or show them in longitudinal section, we cannot be sure how similar they are to those in *Lyngbya*.

At the end of each fiber in *Lyngbya*, there is laid down, against the cell wall, a small granule which stains black with Haidenhain's hema-toxylon. These granules increase in size until they coalesce to form a ring around the center of the cell. This ring marks the place where the cross wall is to be formed, and it can still be seen, around the edge of this wall, after the wall has grown completely across the cell.

The production, at the place where the wall is to appear, of this ring by the fusion of granules formed at the ends of fibers which extend from the nucleus, would seem to indicate that the nucleus plays an important part in the formation of the wall, and that the nuclei of the Cyanophyceae may have functions similar to those of the nuclei of other plants. The presence of the fibers may indicate paths of conduction from the nucleus to the cell wall. DAVIS<sup>2</sup> describes a similar relation between the nucleus and the formation of the blepharoplast in the spores of *Derbesia*. Here strands radiate from the nucleus to the plasma membrane in the form of a funnel. According to this writer, "granules may be found on these strands apparently moving outwards towards the plasma membrane. These numerous granules accumulate in a circle just underneath the plasma membrane and fuse with one another to form a deeply staining firm ring, which is the blepharoplast."

In this discussion the central body of *Lyngbya* has been called a nucleus. This interpretation would seem to be justified by its structure and its relation to the formation of the cross wall.

The writer is indebted to Professor D. S. JOHNSON, in whose laboratory at the Johns Hopkins University the work was carried on, for material, and for other courtesies.—WILLIAM H. BROWN, *Michigan Agricultural College, East Lansing, Mich.*

<sup>2</sup> DAVIS, B. M., Spore formation in *Derbesia*. *Annals of Botany* 22: 1-20. 1908.